Progress and trends in the national open source policies and legal frameworks

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Executive summary

This report provides a qualitative analysis of the state of open source policy in the EU and is based on the research carried out for the series of Country Intelligence Reports analysing open source policies in 15 European and non-European countries, carried out by the European Commission's Open Source Observatory[1]. It showcases the growing significance of open source technologies within the public sector and aims to provide valuable insights for policymakers, public administration officials, and the open source community.

The open source policy trends are understood as the evolution of the political discourse that substantiates the implementation of open source solutions and the development of new policy mechanisms for their implementation.

Key drivers for open source adoption

Governments worldwide, including EU Member States, are increasingly adopting open source to achieve digital sovereignty and address concerns about data privacy and control over digital infrastructures. Additionally, open source has become instrumental in enhancing transparency and speeding up the rollout of essential digital services during crises such as the COVID-19 pandemic and geopolitical events, thereby fostering trust and citizen engagement.

Adoption strategies across administrative levels

Cities, regions, and municipalities are crucial players in open source adoption due to its cost-effectiveness and adaptability to local needs. Collaboration among these entities and regional IT providers is pivotal in driving the increased usage of open source when implementing regional digital services.

At the national level, policy mechanisms are evolving towards testing collaborative approaches involving diverse stakeholders. Initiatives, such as setting up Open Source Programme Offices (OSPOs) and innovative funding strategies, are gaining traction.

Moreover, there has been a surge in global initiatives led by organisations such as the United Nations and the EU, with influence on national policies. Concepts such as Digital Public Goods and Digital Commons are fostering open source discourse at the international diplomatic level.

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[1] Open Source Software Country Intelligence | Joinup

1.   Introduction

The Open Source Observatory (OSOR) is a European Commission platform hosted on the Joinup collaborative portal, serving as the connector between European public administrations and diverse stakeholders involved or interested in open source. Started in 2008, it continuously engages and supports its dynamic community and promotes the use of open source software (OSS) in the public sector while providing relevant expertise and information.

OSOR plays an active role in the open source community by promoting OSS and showcasing successful cases of its adoption within European public administrations. In order to map the status of OSS in the European public sector and identify the trends in its deployment, OSOR published an Annual Report[2] in 2016. This was followed by the launch of OSOR's Open Source Software Country Intelligence Reports in 2019, providing deep dives into national policies and the status of open source in the EU Member States and other countries. These reports were accompanied the same year by a follow-up Annual Report of 2019 analysing the data collected.[3]

Since then, OSOR has updated 9 of those reports and published 7 new ones on non-EU countries, for a total of 45 country reports.[4] They provide the reader with insights into open source policy, initiatives using and promoting it in public services, and how open technologies fit into the larger digital policy landscape. This report provides an analysis based on the progress and trends observed as part of the work conducted for the updated national reports. The aim is to provide an overview of the current state of open source policy internationally and in the EU to facilitate the work of policymakers and administrations when considering the use of open source.

To accomplish this research goal, a conceptual framework was devised to establish a unified approach towards various legal and political systems in this report's scope. As the concepts postulated here are inherent to national (and sometimes local) legal and political cultures, the authors will refer to them as identified "trends," acknowledging that their definitions might vary depending on the context.

In delineating the progression and patterns of policy, the authors have classified them into two categories of progress and trends:

- The first category is made of overarching principles guiding policy development. Here, the analysis focuses on how stakeholders have used

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[2] Open Source Observatory Annual Report 2016

[3] Status of Open Source Software Policies in Europe

[4] Open Source Software Country Intelligence | Joinup

and motivated the implementation of open source within the system they operate.

- The second category comprises policy tools such as strategy papers, guidelines, and best practices handbooks. Here, the focus is on the creation of newly developed policy mechanisms and their evolution when using open source.

Considering open source in its entirety and complexity, it is crucial not to solely centre on the policy question regarding the adoption of open source through strict legal frameworks. Increasingly, open source is viewed as infrastructure and considered in terms of its ecosystem characteristics. This understanding has been shared by open source communities and certain policymakers who have enacted diverse norms to regulate and support open source. Consequently, this report examines open source policy through a broad lens, considering policy norms spanning from local to international levels, encompassing non-binding norms, grassroots initiatives and research as it is those less formal tools that often lay the groundwork for future legislation.

Throughout the OSOR's 15 years of existence, open source has not always been the priority of policymakers in all EU Member States. However, it has become clear that ever since around 2015, the adoption of open source solutions and policies in government has been on the rise. This is consistent with a global trend of increasing adoption of open source policies,[5] with more and more countries applying holistic approaches to the creation of open source policy.

This trend can be attributed to the growing understanding and significance of open source as a cornerstone of our ICT systems. This comprehension, coupled with a richer experience of policymakers of regulating digital markets, has enabled governments to take a more pragmatic approach towards using open source for achieving strategic goals of governments around the world. As outlined in this report, the motivations behind embracing open source are also rooted in the increased regulation of digital technologies, which consequently come under the scrutiny of governments.

Information presented in this report relies primarily on empirical data gathered through desk research and interviews with local experts from the countries under study. Additionally, it draws upon the wealth of content available on the OSOR platform, including news articles, case studies, and reports as well as workshops, webinars, and conferences attended and organised by the OSOR team. This report also takes into account the extensive analysis carried out by OSOR in 2016 and 2019, OSOR's upcoming study on OSPOs as well as research produced by

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[5] Government's Role in Promoting Open Source Software

other researchers, including the quantitative global study analysing open source policies conducted in 2023.[6]

The report takes a qualitative analysis approach as the motives identified behind the policies and trends analysed are based on historical and political contexts tightly connected to the national and local characteristics and political cultures.

Figure 1 Overview of OSOR country intelligence reports

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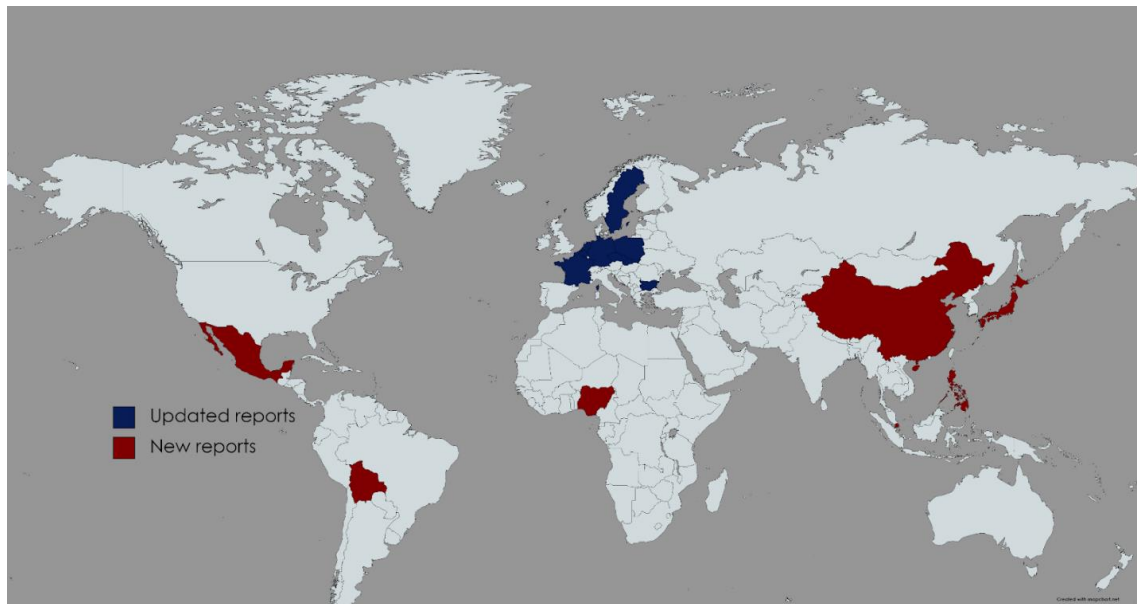
[6] Government Open Source Software Policies | Resources | CSIS

2.   What motives lie behind the increase in the number of open source policies in the EU and globally

In this part, the report aims to examine the motivations that have driven the formulation of open source policies within both European and international settings. It begins by exploring the evolution of concerns regarding data privacy and sovereignty, explaining how they have spread from the European level to national discourses throughout the Union. Subsequently, it analyses how the emphasis on sovereign ICT infrastructure has led to an increased demand and call for transparency and control over these infrastructures by governments.

2.1.   Sovereignty: Understanding the situation, a threat to privacy and control

As the global usage of data has been steadily increasing in the last 15 years, governments have initiated projects to harness the potential benefits of data-based policymaking. At the same time, concerns around the use of citizens' data have been growing. With the enactment of the GDPR[7] and the Schrems court cases,[8,9] norms for the use of ICT infrastructures that are used by citizens have become increasingly stricter. And while these trends sparked from, among others, the international spying scandals revealed at that time,[10,11] policymakers and administrations have had to define potential alternatives to the existing infrastructure to avoid similar and greater risks. The main trend in technology policy discourse that emerged from these concerns is digital sovereignty.

First adopted as a guiding principle by governments outside the EU in the face of the American government influence, digital sovereignty as a policy objective has been coupled with the use of open source as a tool to achieve these goals. One of such countries is Bolivia, where the government declared sovereignty as a goal for all administrative levels in the early 2010's and developed a comprehensive

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[7] 32016R0679 - EN - EUR-Lex

[8] 62014CJ0362 - EN - EUR-Lex

[9] The CJEU judgment in the Schrems II case

[10] The US surveillance programmes and their impact on EU citizens' fundamental rights

[11] Understanding EU data protection policy

open source policy which aimed at taking back control over the country's digital infrastructure.[12] Similar approaches have been adopted in Mexico and China.

Digital sovereignty as a goal was formulated in the EU from the 2010's. One of the countries that took a similar approach is Sweden.[13] Following the adoption of the Schrems' court case and the adoption of the American Cloud Act in 2018, Swedish administrations formulated an alternative ICT policy to comply with the legal data protection of its citizens. This process was started by the eSam group,[14] a member-driven programme for collaboration between public authorities, which aims to facilitate and accelerate the digitisation of the Swedish public sector.

With 34 members representing a wide range of public administration authorities, in 2021 it published a comprehensive guide to open source alternatives to proprietary software which would satisfy the exigence of the local regulation.[15]

> *Outsourcing of IT infrastructure also creates dependence on the service provider. When IT services are outsourced, global service providers are often contracted, which means the resulting dependence is international. This is sometimes expressed as the risk of loss of digital sovereignty – a concept used in the EU context, which means that a state loses some of its control over its independence, autonomy and freedom of action in the digital sphere."*- Cybersecurity in Sweden – Threats, methods, deficiencies, and dependencies

This principle has guided the expansion of open source policy in Sweden, which administrations themselves have led with the support of a national open data and open source network.

The adoption of open source in these countries under the principle of state and data sovereignty in the digital space is symptomatic of a larger trend of digital sphere institutionalisation, one that's motivated by gaining back control and sovereignty of the ICT infrastructure that they are dependent on.[16] There, open source and open technologies have been chosen to achieve those goals.

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[12] Open Source Software Country Report Bolivia, 2024

[13] Open Source Software Country Report Sweden, 2022

[14] eSamverka

[15] Cybersäkerhet i Sverige : hot, metoder, brister och beroenden

[16] Pohle, Julia, and Thorsten Thiel. 2020. "Digital sovereignty". Internet Policy Review 9 (4). DOI: 10.14763/2020.4.1532. https://policyreview.info/concepts/digital-sovereignty.

2.2.　Sovereignty as an objective

The European Union has been expressing concerns regarding its digital sovereignty since the legislative period of 2014-2019, notably marked by the adoption of the GDPR. With Ursula von der Leyen assuming the presidency of the institution in 2019, the European Commission has made a commitment for the EU to attain digital sovereignty.[17] Under this banner, sovereignty implies Europe's vow to increase its capability to operate autonomously in the digital realm, ensuring that European countries have more control over both the supply chains and digital products. This aspiration has been translated into EU regulations such as the Critical Raw Materials Act, the DSA and DMA (Digital Services Act and Digital Markets Act), and the EU's revised standardisation strategy presented in 2022.

This prioritisation of digital sovereignty at the European level was developed in parallel by France and Germany, two of the bloc's major political influences, who have adopted similar policy objectives in the last 5 years. This shift in political values has been translated into actions as both countries have enacted policies and approaches that, while different, share the same goals of achieving digital sovereignty.

In France, the question of digital sovereignty has been discussed at length since 2014,[18] and open source has often been chosen for its independence qualities compared to proprietary solutions.[19] Many public officials have been experimenting with open source for years as part of their daily work in agencies. These efforts have later been translated into higher levels of administration. DINUM, the Interdepartmental Administration for Digital Services, together with its free software unit, have since been coordinating the implementation of open source in government. This has contributed to the development of several open source strategies, for instance, the Ministry of Education Digital Strategy for 2023-2027 recommending open source solutions for their "sovereign characteristics" which are understood more broadly as a promise on the European, and not only national, scale.[20]

Germany has developed a similar sovereignty-based open source policy. The creation of its Centre for Digital Sovereignty (ZenDiS) in 2022 is the most direct testimony to the country's commitment to achieving the objectives of its digital

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[17] Digital sovereignty for Europe

[18] La République numérique en débat au Parlement : le projet de commissariat à la souveraineté numérique

[19] https://www.senat.fr/rap/r19-007-1/r19-007-11.pdf

[20] France Digital Strategy for Education supports the use of "digital commons"

strategy of 2022.[21] There, open source is put forward as the technical means to increase control over the country's governmental digital infrastructure. ZenDiS has also started developing two essential projects: Open CoDE[22], an OSS repository for public administrations, and the Sovereign Workplace[23], an interoperable OSS-based workplace solution developed for the public sector as an alternative to proprietary offerings. Effectively, Germany's overall strategy defines digital sovereignty as a value that will benefit the country long-term through several initiatives while also developing tools that support it. The country is strongly promoting digital sovereignty as a concept while open source is meant as a tool to achieve this goal.

2.3.　　　Transparency and accountability

Although the call for sovereignty has emerged relatively recently from states and institutions to uphold a strategic global advantage, the issue of transparency has been a part of political discourse for more than a decade. It has become a guiding principle at the European and national level behind the development of new digital policies at the beginning of 2010's, strongly promoted by open data movements.

Some EU Member States have pushed for more transparency in their government policy as part of their pursuit of a more direct and participative democracy. This is the case of the Netherlands, which enacted a strong "open unless" policy in 2020 and has since deployed means across its ministries and agencies to develop their open source capacity to enact this policy. The "open unless" policy directly derives from the openness approach to government information introduced by former pieces of legislation and tendencies in the Dutch government.[24]

Here, the strong focus on openness in government started amid transparency concerns as early as the 1980s. Over time, it has translated both into digital policies of the country and to the source code and IT development models.[25] This approach is also reinforced by the Open Government Act (Woo) from 2022, updating a former public information disclosure framework and defining an active duty for disclosure of government information, including source code. The Act has been actively used for disclosing source code used by the government, including a Woo request, where Logius, an agency of the Ministry of Interior and

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[21] Digital Strategy Creating Digital Values Together

[22] Open CoDE

[23] CIO Bund - Souveräner Arbeitsplatz

[24] Data Agenda Government

[25] Transparency and Access to Government Information in the Netherlands | SpringerLink

Kingdom Relations, agreed to disclose a snapshot of the source code of DigiD and subsequently modified its development methods for further releases.[26]

The trend in transparency can also be found at an international level, with initiatives such as the OpenGovernment Partnership,[27] which has 21 of the EU Member States among its members. There, the use of transparent processes and technologies supports openness in government, therefore underlying the need for open source in many of the national programmes established in this partnership. Some countries clearly define their plans to use open source as a means to fulfil the commitments that each country promises to adhere to in their national OGP Plans. France, which has placed the "support for the digital commons" as one of its top goals, is one such example.[28]

Open government and open data practices, initiatives, and policies have shown how governments can crystallise their adherence to transparent, accountable policymaking and regulation of technology in line with citizens' demands. For example, the Netherlands and Belgium are the first to officially recognise open source as an important driver of a more open government in their policies on openness and open data developed in compliance with the Public Sector Information (PSI) directive.[29] Since then, a lot has changed, and several EU Member States have made significant steps to bring a new institutional layer to using, sharing, maintaining, and developing OSS, which will be discussed in the next part of this report.

2.4.   Crisis response and efficiency

As governments are relying more and more on digital infrastructures to fulfil their roles towards the citizens, new obligations have emerged when providing digital public services, especially when faced with crises.

Over the past five years, the EU has faced two major crises - the Covid-19 pandemic and the invasion of Ukraine - pointing to the increased need for strategic autonomy, which can be supported by open source. Several successful open source use cases have enhanced living conditions of many citizens and facilitated faster crisis responses, building on its efficiency and transparency.

This demand became especially prominent during times of the Covid-19 crisis when several parts of daily life, such as education, work, and social interactions,

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[26] Beslisnota bij Kamerbrief over openbaarmaking broncode DigiD-app | Beleidsnota

[27] About

[28] Open Source Software Country Intelligence Report France 2023

[29] Open Data Directive | Joinup

moved to the digital realm and when trust in governments and institutions was put to the test. During the first months of the Covid-19 pandemic, the important collaboration between citizens and their governments as well as among governments at the EU level enabled the quick adoption of digital solutions and the establishment of digital infrastructure which were essential to the tracing of contaminations and administering vaccinations. While similar trends were observed in other regions and countries like Singapore,[30] the speed, reach, and efficiency with which Covid apps were developed in the EU under open source frameworks was exceptional on a global scale.[31]

Notably, instances of government collaboration with local open source communities, such as the development of CoronaMelder between Code for NL[32] - a pillar of the Dutch open source community - and the Dutch government, demonstrated the efficacy of such collaborative approaches.[33,34] This app served as a contact tracing tool for citizens. There, epidemiologists, developers, testers, lawyers, architects, and other actors collaborated to create a quick technical solution to respond to a major crisis.

This upward trend of openness in the development of digital solutions has shown great promise. The use of open source in times of crisis can provide a rational course of action to promptly meet sudden large demand for specific systems and solutions due to the capacity to swiftly mobilise diverse resources independently.

This was also the case with the development of various digital services addressing the needs that emerged amid the invasion of Ukraine at the beginning of 2022. Developers from the neighbouring countries stepped in with unprecedented speed to fill the gaps in the deployment of necessary digital services as the European governments were unable to react quickly enough. Whether providing essential information to facilitate crossing the border into Hungary[35] or facilitating access to accommodation in Poland,[36] open source solutions have been essential additions to the capacity of national governments, offering a form of international resilience.

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[30] BlueTrace

[31] Report on the role of open source in the digital response to COVID-19 in the EU

[32] Code for NL

[33] And announces bug bounty | Joinup

[34] Veilige en nuttige corona-app: kan dat? - Online samenwerking - Achtergrond - Tweakers

[35] Developers for Ukrainians in Hungary | Joinup

[36] Volunteering on accommodation for Ukrainians in Europe | Joinup

This process echoes the way the European Union has built itself over the decades, having to find new ways to collaborate to face each crisis.[37] While the political outcomes of each of the union's crises differ, European collaboration keeps getting stronger through collective action.[38] In such moments, a collaborative approach to developing digital public services has empowered governments to swiftly create evolving services that offer sufficient transparency and control for citizens to use them independently. In times of crisis, open source has also been used by citizens, both local and from neighbouring countries, to support the government in providing the necessary services.

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[37] "I have always believed that Europe would be built through crises, and that it would be the sum of their solutions." Monnet, J. (1978). Memoirs. United Kingdom: Collins.

[38] The EU and the Creative and Destructive Impact of Crises - Carnegie Europe

3. Where did open source gain momentum, and how was it implemented?

3.1. National level

Policy mechanisms specifically dedicated to OSS have strongly evolved over the last 10 years, especially on the national level, both in the EU and globally. As such, national governments have attempted to use open source through various means: hard law obligations, soft law, procurement legislation and guidelines valorising it, recommendations, and funding schemes.

3.1.1. Mandatory use of open source

The 2010s were marked by the rise of regulation mandating the use of open source in public administration. However, countries implementing such regulations often encountered mixed results, particularly when those policies were not complemented by supplementary regulations and adjustments to the functioning of administrations.[39] For instance, a Bulgarian national law reform in 2016[40] required procuring open source by public administrations as a first choice under the threat of fines, yet the law has had little effect and didn't kickstart a sudden increase in usage of open source as some had hoped for. It is not a solitary case of unsuccessfully introducing an open source technology regulation, which showcases the complexity of enforcing the ambitious goals of leveraging open source in public administrations, especially when faced with sudden changes without additional training and guidance. Similar cases were observed with the Greek eGovernance law[41] or the Italian Code of Digital Administration[42]. They also faced difficulties when introducing mandatory provisions without proper support to this kind of policy.[43]

While the mandatory use of open source was welcome and desired by many policymakers and open source communities in these countries, the lack of bodies with clear mandates to enforce it and dependency on ever changing executive

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[39] Study about the impact of open source software and hardware on technological independence, competitiveness and innovation in the EU economy | Shaping Europe's digital future

[40] Законопроекти - Народно събрание на Република България

[41] Law 3979/2011

[42] Codice Amministrazione Digitale|Agenzia per l'Italia digitale

[43] Interview: Fabio Bonelli of Developers Italia | Joinup

powers and their priorities have led to the inconsistent uptake and implementation of these policies. Policymakers recognised that newly developed open source policies require innovative organisational methods and extensive collaborative approach, involving various parts of the concerned ecosystem.

3.1.2. Bottom-up collaboration

Historically, for open source policies to succeed, more multidimensional and multi-stakeholder approaches are needed to overcome challenges such as rapidly changing political priorities, governments, and funding mechanisms, especially in light of the decentralised and collaborative nature of open source and its stakeholders.[44]

Examples of this collective, diversified approach succeeding can be found throughout Europe and the globe. In Czechia, it was the rise and collaboration of associative and governmental actors that facilitated broader adoption of open source within the state. There, the work between a not-for-profit organisation Open Cities and the Digital and Information Administration is crucial to the management and facilitation of the national open source code sharing portal.[45] Up north, in Sweden, it was the country's E-Delegation that, after completing its original mission to coordinate the state authorities' IT-based development projects, evolved to become eSam, which took on a major role in developing the digitisation guidelines of the country. The bottom-up approaches, involving a broad range of actors, allowed these countries to put their goals of openness, transparency, and sovereignty into practice by means of open source.

A more recent example of this approach is the Free Software Council (Conseil Logiciels Libres) in France, created in 2022. DINUM, the Interdepartmental Administration for Digital Services (as part of its Free and Open Source Software Mission) formed a council whose membership includes public officials from administrations committed to the use and development of free software as well as representatives of associations and open source foundations representing citizens, local authorities, and companies. It is a space for DINUM and members to share expertise, which can later support DINUM in formulating its strategies. This mobilisation of the open source community shows a greater level of understanding of how the public sector can harness the potential of open source when it considers it for its ecosystem characteristics. While only recently created, the council can take up any issue at the intersection between OSS and the digital

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[44] European Commission, Directorate-General for Communications Networks, Content and Technology, Blind, K., Pätsch, S., Muto, S. et al., *The impact of open source software and hardware on technological independence, competitiveness and innovation in the EU economy – Final study report*, Publications Office, 2021, https://data.europa.eu/doi/10.2759/430161

[45] Portál otevřeného kódu

transformation of the public sector and submit an advisory opinion to DINUM, which the council may or may not decide to make public. These mechanisms and organisations demonstrate how some governments are benefiting from coordination when developing open source policy.

3.1.3. Open Source Programme Offices

Another construct helpful in implementing open source policies is recognising the need to support coordinating various actors and interests at play in the open source ecosystem. It is a new structure of open source management in the public sector that has emerged in the last few years - the Open Source Programme Office (OSPO)[46]. OSPOs, well-established in the private sector, respond to an important organisational need as public sector organisations are often ill-equipped to adapt to the complexity and very different organisational structures of open source projects. OSPOs, while multiform, have common responsibilities that have been identified in OSOR's upcoming study on OSPOs.

- Providing support for design and execution of OSS strategies

- Providing support for use and adoption of OSS

- Providing support for development and release of OSS

- Providing support for licence selection and monitoring

- Developing and managing key OSS applications

- Introducing and providing support for Inner Source practices

- Analysing and following up on OSS adoption and evolution

- Communicating and managing relations with the external OSS ecosystem

- Providing training and education on OSS

Through their unique position in the public sector institutions, they take on the task of coordinating various policy and organisational strategy through the prism of open source. Present in different forms and placed in different parts of the public services (national government, institution-centric, association-based, local government, academic or independent), OSPOs have so far been formally implemented in national governments in France, Italy, Germany, and Luxembourg. Overall, OSPOs in the public sector in various forms have been identified across at least 13 EU Member States.

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[46] Supporting Open Source Software in the European Public Sector – The Role of Open Source Program Offices

3.1.4. Digital infrastructure security

Following the prominent cyberattacks such as Log4J and Log4Shell in 2021, it has become clear to more and more governments that there is a higher need to secure their digital infrastructure. While debated, the auditability of open source has been put forward by many as a way to mitigate cybersecurity risks in critical areas. With around 70 to 90% of all digital infrastructure including open source components, policymakers have started to take into account interdependencies related to open source used in existing digital infrastructures needed to deliver public services. This ecosystem, as proven by the major attacks on open source components, needs to be acknowledged and maintained. With open source security becoming a priority, governments have developed diverse maintenance and security strategies.

One example is channelling funding to open source projects needing maintenance or support, i.e., the German Sovereign Tech Fund being financed by the Federal Ministry for Economic Affairs and Climate Action. It funds critical open source projects that keep the public administration functioning with a focus on meeting security and resilience objectives.[47] This funding approach can also be seen in other countries through the rise of hackathons with important monetary prizes for bug bounties and app development.[48,49,50] At the European level, policy projects, such as Free and Open Source Software Auditing (FOSSA)[51] and Free and Open Source Software Solutions for European Public Services (FOSSEPS)[52], have both looked into the critical infrastructure and their need for maintenance and therefore funding. Moreover, a significant part of the funding from the European Commission's Next Generation Internet with initial investment of EUR 250 M is directed to open source solutions, having supported over 1000 innovators as of 2023.[53] These projects have led to further development in policy regarding funding[54] and security[55] strategies for the EU.

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[47] Sovereign Tech Fund

[48] Hackathons | LATA

[49] Estonia's Digital Testbed Framework - join our country-sized hackathon!

[50] Join our next open source BIG Hackathon featuring X-Road®!

[51] EU-FOSSA 2 - Free and Open Source Software Auditing

[52] FOSSEPS - Free and Open Source Software Solutions for European Public Services

[53] NGI - about

[54] Funding Sustainability | Joinup

[55] FOSSEPS Critical Open Source Software Study Report | Joinup

3.2.   Cities and regions level

There is a growing understanding in public administrations of the open source ecosystem and the benefits that can come from interacting with this ecosystem. It is in part due to synergies with the implementation of open technologies at the local level across the EU Member States. The local governments' contributions in cities and regions have been crucial to the evolution of a more global open source policy. This stems from the necessity for accessible and cost-effective solutions that can easily adapt to local contexts. There are cities which have paved the way for open source through independent work. Sundsvall in Sweden is one example, earning recognition as Sweden's Digitalisation City. For nearly two decades it was developing unique local policies on open technologies. However, cross-border and intermunicipal approaches would be recommended in most contexts for efficient and long-term results.[56]

3.2.1. Collective approach to IT development and pooling of resources

In Germany, where federal states have broader policy prerogatives, certain states, such as Schleswig-Holstein, have demonstrated they can switch a wide range of digital solutions used in the public sector to open source.[57] This alternative governance model has enabled local experimentation that might have been more difficult at national scale. Other German states, through the work of regional IT providers, have been able to develop wider-scale implementation schemes for open source. These semi-private public infrastructure like Vitako (Federal Working Group of Municipal IT Service Providers) or the KGSt (professional association for municipal management) have made it possible for smaller cities to experiment and adopt open source solutions while conducting large scale studies.[58]

Similar collective associations, Adullact[59] in France and iMio[60] in Belgium, lead the reuse and sharing of open source solutions among municipalities. These initiatives have shaped readily deployable solution packages, facilitating open source adoption for smaller administrations, sometimes even without state support. This adoption model, rooted in current, proven needs of the concerned

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[56] Dagens Samhälle hyllar Sundsvalls kommuns arbete med digitalisering – toppar lista

[57] Linux-Arbeitsplatz für die öffentliche Verwaltung

[58] Open Source in Kommunen - Ein Baustein für mehr Digitale Souveränität

[59] Adullact

[60] iMio

municipalities, provides a more sustainable model of digitisation due to its resilience.

3.2.2. Reuse of field-specific solutions

Another local-level trend is related to the municipalities' prerogatives for certain defined public services. As they are often confined to smaller budgets and possibilities when it comes to policymaking, many administrations have turned to open source solutions in fields such as local transport[61], democracy[62], environmental issues[63], monitoring of public space[64], and park management[65]. Many of them have realised that they face very similar challenges with locally dependent, less significant differences, which can be easily adjusted when reusing open source solutions. Solutions shared by several municipalities within a country and globally comprise instances of cross-border reuse of solutions with geo-mapping, democratic participatory platforms, and other services crucial to the functioning of local administrations.

3.2.3. Associative support

These efforts are also supported by associative networks that have developed applications for their territory, often out of their own initiative and as part of not-for-profit activities. Significant examples of dynamic local organisations, such as Open Cities in the Czech Republic or Slovensko.Digital in Slovakia, have shown the importance of such NGOs. There, the associations have been able to play a larger role in the overall regional and national open source policy, as the results of their own projects have been successful. This tendency can also be seen in the Netherlands, Belgium, and Germany, where very strong associative networks have enabled local development of solutions adapted to individual needs of several cities.

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[61] Stadtnavi drives cleaner air with Open Source | Joinup

[62] Metadecidim

[63] GitHub - undp/carbon-registry: National Carbon Credit Registry Digital Public Good (DPG) by Digital For Climate (D4C) collaboration. Code coordinated by ExO/CDO & BPPS/Climate.

[64] GitHub - mysociety/fixmystreet: This is mySociety's popular map-based reporting platform: easy to install in new countries and regions

[65] GitHub - GeotrekCE/Geotrek-admin: Paths management for National Parks and Tourism organizations

3.3.   European and international level

The use of open source solutions by local governments is not only motivated by local capacities but also broadly encouraged by initiatives at the international level, which have identified local governments as important resilient actors needed to implement such policies. These global and international initiatives reinforce the existing national policies.

3.3.1. Sustainable Development Goals

The United Nations stands as a robust advocate for open source on the international stage. The organisation has actively promoted open source within its various development programmes. Open source has been identified as a means for UN mission countries to achieve their Sustainable Development Goals.[66] Initiatives, such as the Digital Public Goods Alliance, which fosters technology sharing and has set up a standard for Digital Public Goods that supports fulfilling the Sustainable Development Goals, have emerged as high-level technological diplomacy examples. The use of open source solutions has enabled nations involved to provide digital services to their citizens at a reduced cost.[67,68]

3.3.2. Digital Commons

The concept of Digital Public Good is prominent on the international stage, and it is linked to other notions such as digital commons and digital infrastructure. While there are multiple existing definitions, digital commons can be described as non-rivalrous and non-exclusive collectively governed immaterial resources. The topic of digital commons gained prominence under the French presidency of the Council of the European Union of 2022, influencing international open source projects and initiatives.[69]

The notion of digital commons has been used by different actors alongside other terms to refer to open technologies. And while the idea of digital commons has

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[66] OSS4SDG - Gender Equality - Home

[67] Open Source Country Intelligence Report Philippines, 2023

[68] State of the Digital Public Goods Ecosystem 2023

[69] Declaration by the Presidency of the Council of the European Union calling for a European Initiative for Digital Commons

been coined earlier,[70] the modern use of that notion by EU actors has further redefined it to fit a new political narrative. Used as a diplomatic tool, this notion has been recognised by the EU in its cooperation with the UN on the Global Digital Compact.[71]

At global level, the notion of digital commons is now used to foster further cooperation on the creation of technological solutions.[72] At European level, the European Commission through its Next Generation Internet (NGI) initiative is funding projects related to digital commons. Through two dedicated funds, the NGI initiative is supporting technologies that fit the definition of digital commons.[73,74]

3.3.3. Global solutions for global problems

Such global initiatives often focus on creating wider international networks working together to promote and support open source and digital commons. Some organisations have already been able to take advantage of existing projects that have been reused and adapted internationally. One of the best examples of this are the geo mapping tools from the OSGeo community[75], which have reached billions of people around the world, providing essential services. With developers from various continents, these projects have received support from the UN and national governments such as Japan.[76] At the same time, some countries, like China, choose to collaborate directly with open source foundations, which are steering wide arrays of projects.[77]

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[70] Felix (2010). Digital Commons. In: Hart, Keith; Laville, Jean-Louis; Cattani, Antonio David (eds). The Human Economy: A World Citizen's Guide. Cambridge, UK, Polity Press, pp. 313-324

[71] EU Statement – UN Global Digital Compact: Deep Dive on Global Digital Commons | EEAS

[72] A Global Digital Compact — an Open, Free and Secure Digital Future for All

[73] NGI COMMONS

[74] NGI ZERO COMMONS FUND

[75] OSGeo

[76] UN Open GIS Initiative

[77] 工业和信息化部关于印发"十四五"软件和信息技术服务业发展规划的通知_国务院部门文件

4.   Conclusions

Overall, this report has identified key takeaways for policymakers, public administrations officials, and the open source industry and community to facilitate the use of open source in the public sector.

Motives driving open source adoption

Sovereignty: Countries worldwide, including EU members, are embracing open source to secure digital independence. Concerns over data privacy and control have led to policies prioritising sovereignty in the digital sphere.

Transparency and accountability: Governments are under pressure to provide transparent and efficient public services. Open source is being leveraged to enhance transparency, particularly during crises like the COVID-19 pandemic and geopolitical events, promoting trust and citizen engagement.

Implementation methods across different levels

National level: Evolving policy mechanisms involve a shift from the mandated open source use to collaborative co-creation approaches involving diverse stakeholders. Entities, such as Open Source Programme Offices (OSPOs), and new funding strategies and initiatives are gaining traction.

Local (cities and regions): Municipalities and regions are key players adopting open source for cost-effectiveness and customisation to local needs. Here, collaboration among cities, associative networks, and regional IT providers is driving open source adoption.

European and international level: Global initiatives by the United Nations and the EU are influencing national policies. Concepts like Digital Public Goods and Digital Commons are fostering open source adoption at an international diplomatic level.

Comprehensive policy is key: Open source policy trends lean towards increased collaborative efforts involving various stakeholders – governmental bodies, associations, international organisations, and open source communities – to be efficient. In essence, the report showcases how open source policies have evolved from focusing on legal considerations of public procurement to comprehensive ecosystem approaches, addressing sovereignty, transparency, and collaborative implementation strategies across different administrative levels, both domestically and internationally.

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